

WHAT IS CLAIMED IS:

- 1     1.   An apparatus for entering and exiting a spacesuit in a  
2       spacecraft, said spacesuit (1) having a spacesuit, entrance  
3       and exit opening (2) in a back portion of said spacesuit,  
4       said apparatus comprising a backpack (3) for opening and  
5       closing said opening (2) of said spacesuit, said apparatus  
6       comprising:
  - 7       (a)   a first sealing and interlocking subsystem (4)  
8           operatively interposed between said spacesuit (1) and  
9           a bulkhead (5') in said spacecraft (S) for connecting  
10          said spacesuit (1) to said bulkhead (5) in an  
11          interlocking force transmitting fit,
  - 12       (b)   a second sealing and interlocking subsystem (6)  
13           operatively interposed between said backpack (3) and  
14           said back portion of said spacesuit (1) around said  
15           opening (2) for connecting said backpack (3) to said  
16           spacesuit (1) in an interlocking and force  
17           transmitting fit,
  - 18       (c)   a laterally flappable decontamination chamber (7) into  
19           which said backpack (3) fits,
  - 20       (d)   a third sealing and interlocking subsystem (9)  
21           operatively interposed between said spacesuit (1) or  
22           backpack (3) and said decontamination chamber (7) for  
23           connecting said spacesuit to said decontamination  
24           chamber (7) in an isolating manner, and
  - 25       (e)   a fourth sealing and interlocking subsystem (12)  
26           operatively interposed between said at least one  
27           decontamination chamber (7) and said bulkhead (5') in

28           said spacecraft for connecting said decontamination  
29           chamber (7) to said bulkhead (5') in an isolating  
30           manner.

1       2.    The apparatus of claim 1, wherein said first sealing and  
2           interlocking subsystem (4) is arranged radially outwardly  
3           of said entrance and exiting opening (2) and wherein said  
4           second sealing and interlocking subsystem (6) is arranged  
5           radially inwardly of said first sealing and locking  
6           subsystem.

1       3.    The apparatus of claim 1, wherein said laterally flappable  
2           decontamination chamber comprises an open side surrounded  
3           by a chamber flange (7A), and wherein said third sealing  
4           and locking subsystem (9) is arranged radially inwardly of  
5           said chamber flange (7A) for connecting said backpack (3)  
6           of said spacesuit to said decontamination chamber (7) with  
7           an interlocking, force transmitting fit.

1       4.    The apparatus of claim 3, wherein said fourth sealing and  
2           locking subsystem (12) is arranged radially outwardly of  
3           said chamber flange (7A) for connecting said  
4           decontamination chamber (7) to said bulkhead (5') with an  
5           interlocking force transmitting fit.

1       5.    The apparatus of claim 1, further comprising a hinge (H)  
2           between said bulkhead (5') and said decontamination chamber  
3           (7) for opening and closing a hole (5A) in said bulkhead

(5') by laterally flapping said decontamination chamber into an open position or back into a closed position.

6. The apparatus of claim 5, further comprising a docking flange (10) framing said hole (5A) in said bulkhead (5').

7. The apparatus of claim 6, wherein said first sealing and locking subsystem (4) surrounds said docking flange (10) radially outwardly of said docking flange (10).

8. The apparatus of claim 6, wherein said second sealing and locking subsystem (6) is positioned radially inwardly of said docking flange (10).

9. The apparatus of claim 6, wherein said docking flange (10) comprises a ring portion (10A), a radially outwardly extending flange portion connected to said ring portion (10A) and facing said spacesuit (1), and a radially inwardly extending flange portion connected to said ring portion and facing said backpack (3).

10. The apparatus of claim 6, further comprising a seal (S) between said docking flange (10) and a rim of said hole (5A) in said bulkhead (5').

11. The apparatus of claim 1, wherein said bulkhead (5') separates a living and working area (5) from an airlock or protective sluice (11).

1     **12.** The apparatus of claim 1, wherein said backpack (3)  
2         comprises a separate hinge (H') for tilting or flapping  
3         said backpack (3) with said decontamination chamber (7)  
4         laterally away from said bulkhead (5') either in unison  
5         with or separately from said decontamination chamber (7).

1     **13.** The apparatus of claim 1, wherein said decontamination  
2         chamber (7) forms a door for said hole (5A) in said  
3         bulkhead (5').

1     **14.** A method of entering a spacesuit by an astronaut, said  
2         method comprising the following steps:

- 3         a) using an apparatus as defined in claim 1,
- 4         b) entering said spacesuit through said opening in said  
5             back portion of said spacesuit,
- 6         c) hermetically sealing said decontamination chamber (7)  
7             to said bulkhead (5') by closing said fourth sealing  
8             and interlocking subsystem (12),
- 9         d) hermetically sealing said backpack (3) to said back  
10            portion of said spacesuit (1) by closing said second  
11            sealing and interlocking subsystem (6),
- 12        e) pressurizing said decontamination chamber (7, 7') to  
13            a pressure level corresponding to an external pressure  
14            level,
- 15        f) releasing said backpack (3) from said decontamination  
16            chamber (7, 7') by opening said third sealing and  
17            locking subsystem (9),
- 18        g) unlocking said first sealing and interlocking  
19            subsystem (4), and
- 20        h) releasing said spacesuit from said bulkhead (5').